

WHAT IS CLAIMED IS:

1. A method for maintaining a reactor chamber of a chemical vapor deposition system, comprising:

repeating the following until a volume of cleaning gas used during one or more plasma clean cycles has reached a predetermined volume:

depositing one or more layers outwardly from an inner surface of a reactor chamber of a chemical vapor deposition system, the one or more layers forming an accumulation layer;

establishing that the accumulation layer has reached a specified thickness;

performing a plasma clean cycle by introducing the cleaning gas into the reactor chamber; and

calculating the volume of the cleaning gas used during the one or more plasma clean cycles, the volume of the cleaning gas indicating the volume of cleaning gas introduced into the reactor chamber; and

providing a notification that the volume of the cleaning gas used during the one or more plasma clean cycles has reached the predetermined volume.

2. The method of Claim 1, wherein depositing the one or more layers outwardly from the inner surface of the reactor chamber comprises repeating the following for one or more semiconductor wafers:

receiving a semiconductor wafer of the one or more semiconductor wafers; and

depositing a layer of the one or more layers on the received semiconductor wafer.

3. The method of Claim 1, wherein depositing the one or more layers outwardly from the inner surface of the reactor chamber comprises repeating the following until the specified thickness is reached:

5 receiving a semiconductor wafer of one or more semiconductor wafers;

depositing a layer of the one or more layers on the received semiconductor wafer; and

calculating the thickness of the accumulation layer.

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4. The method of Claim 1, wherein calculating the volume of the cleaning gas used during the one or more plasma clean cycles comprises:

15 establishing a parameter related to the flow of the cleaning gas according to a mathematical relation;

measuring the parameter during the one or more plasma clean cycles to yield a measurement; and

20 calculating the volume of the cleaning gas in accordance with the measurement and the mathematical relation.

5. . The method of Claim 1, wherein calculating the volume of the cleaning gas used during the one or more plasma clean cycles comprises:

5 establishing a volume per time of the flow of the cleaning gas;

measuring the duration of the flow of the cleaning gas during the one or more plasma clean cycles to yield a measurement; and

10 calculating the volume of the cleaning gas in accordance with the measurement and the volume per time of the flow of the cleaning gas.

6. The method of Claim 1, further comprising scheduling a chamber maintenance procedure in response to
15 the notification that the volume of the cleaning gas used during the one or more plasma clean cycles has reached the predetermined volume.

7. A chemical vapor deposition system, comprising:
a plasma clean apparatus operable to repeat the
following until a volume of cleaning gas used during one
or more plasma clean cycles has reached a predetermined
5 volume:

deposit one or more layers outwardly from an
inner surface of a reactor chamber of a chemical vapor
deposition system, the one or more layers forming an
accumulation layer; and

10 perform a plasma clean cycle by introducing the
cleaning gas into the reactor chamber when the
accumulation layer has reached a specified thickness; and

a processor coupled to the plasma clean apparatus
and operable to:

15 calculate the volume of the cleaning gas used
during the one or more plasma clean cycles, the volume of
the cleaning gas indicating the volume of cleaning gas
introduced into the reactor chamber; and

provide a notification that the volume of the
20 cleaning gas used during the one or more plasma clean
cycles has reached the predetermined volume.

8. The system of Claim 7, wherein the plasma clean
apparatus is operable to deposit the one or more layers
25 outwardly from the inner surface of the reactor chamber
by repeating the following for one or more semiconductor
wafers:

receiving a semiconductor wafer of the one or more
semiconductor wafers; and

30 depositing a layer of the one or more layers on the
received semiconductor wafer.

9. The system of Claim 7, wherein the plasma clean apparatus is operable to deposit the one or more layers outwardly from the inner surface of the reactor chamber by repeating the following until the specified thickness is reached:

5 receiving a semiconductor wafer of one or more semiconductor wafers;

depositing a layer of the one or more layers on the received semiconductor wafer; and

10 calculating the thickness of the accumulation layer.

10. The system of Claim 7, wherein the processor is operable to calculate the volume of the cleaning gas used during the one or more plasma clean cycles by:

15 establishing a parameter related to the flow of the cleaning gas according to a mathematical relation;

measuring the parameter during the one or more plasma clean cycles to yield a measurement; and

20 calculating the volume of the cleaning gas in accordance with the measurement and the mathematical relation.

11. The system of Claim 7, wherein the processor is operable to calculate the volume of the cleaning gas used during the one or more plasma clean cycles by:

5 establishing a volume per time of the flow of the cleaning gas;

measuring the duration of the flow of the cleaning gas during the one or more plasma clean cycles to yield a measurement; and

10 calculating the volume of the cleaning gas in accordance with the measurement and the volume per time of the flow of the cleaning gas.

12. The system of Claim 7, wherein the processor is further operable to schedule a chamber maintenance
15 procedure in response to the notification that the volume of the cleaning gas used during the one or more plasma clean cycles has reached the predetermined volume.

13. Software for maintaining a reactor chamber of a chemical vapor deposition system, the software embodied in software and operable to:

5 repeat the following until a volume of cleaning gas used during one or more plasma clean cycles has reached a predetermined volume:

deposit one or more layers outwardly from an inner surface of a reactor chamber of a chemical vapor deposition system, the one or more layers forming an accumulation layer;

establish that the accumulation layer has reached a specified thickness;

perform a plasma clean cycle by introducing the cleaning gas into the reactor chamber; and

15 calculate the volume of the cleaning gas used during the one or more plasma clean cycles, the volume of the cleaning gas indicating the volume of cleaning gas introduced into the reactor chamber; and

provide a notification that the volume of the cleaning gas used during the one or more plasma clean cycles has reached the predetermined volume.

25 14. The software of Claim 13, operable to deposit the one or more layers outwardly from the inner surface of the reactor chamber by repeating the following for one or more semiconductor wafers:

receiving a semiconductor wafer of the one or more semiconductor wafers; and

30 depositing a layer of the one or more layers on the received semiconductor wafer.

15. The software of Claim 13, operable to deposit the one or more layers outwardly from the inner surface of the reactor chamber by repeating the following until the specified thickness is reached:

5 receiving a semiconductor wafer of one or more semiconductor wafers;

 depositing a layer of the one or more layers on the received semiconductor wafer; and

 calculating the thickness of the accumulation layer.

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16. The software of Claim 13, operable to calculate the volume of the cleaning gas used during the one or more plasma clean cycles by:

15 establishing a parameter related to the flow of the cleaning gas according to a mathematical relation;

 measuring the parameter during the one or more plasma clean cycles to yield a measurement; and

20 calculating the volume of the cleaning gas in accordance with the measurement and the mathematical relation.

17. The software of Claim 13, operable to calculate the volume of the cleaning gas used during the one or more plasma clean cycles by:

5 establishing a volume per time of the flow of the cleaning gas;

measuring the duration of the flow of the cleaning gas during the one or more plasma clean cycles to yield a measurement; and

10 calculating the volume of the cleaning gas in accordance with the measurement and the volume per time of the flow of the cleaning gas.

18. The software of Claim 13, further operable to schedule the chamber maintenance procedure in response to
15 the notification that the volume of the cleaning gas used during the one or more plasma clean cycles has reached the predetermined volume.

19. A system for maintaining a reactor chamber of a chemical vapor deposition system, comprising:

means for repeating the following until a volume of cleaning gas used during one or more plasma clean cycles
5 has reached a predetermined volume:

depositing one or more layers outwardly from an inner surface of a reactor chamber of a chemical vapor deposition system, the one or more layers forming an accumulation layer;

10 establishing that the accumulation layer has reached a specified thickness;

performing a plasma clean cycle by introducing the cleaning gas into the reactor chamber; and

calculating the volume of the cleaning gas used
15 during the one or more plasma clean cycles, the volume of the cleaning gas indicating the volume of cleaning gas introduced into the reactor chamber; and

means for providing a notification that the volume of the cleaning gas used during the one or more plasma
20 clean cycles has reached the predetermined volume.

20. A method for maintaining a reactor chamber of a chemical vapor deposition system, comprising:

repeating the following until a volume of cleaning gas used during one or more plasma clean cycles has reached a predetermined volume:

depositing one or more layers outwardly from an inner surface of a reactor chamber of a chemical vapor deposition system, the one or more layers forming an accumulation layer, by:

repeating the following for one or more semiconductor wafers: receiving a semiconductor wafer of the one or more semiconductor wafers, and depositing a layer of the one or more layers on the received semiconductor wafer; and

repeating the following until the specified thickness is reached: receiving a semiconductor wafer of the one or more semiconductor wafers, depositing a layer of the one or more layers on the received semiconductor wafer, and calculating the thickness of the accumulation layer;

establishing that the accumulation layer has reached a specified thickness;

performing a plasma clean cycle by introducing the cleaning gas into the reactor chamber; and

calculating the volume of the cleaning gas used during the one or more plasma clean cycles, the volume of the cleaning gas indicating the volume of cleaning gas introduced into the reactor chamber, by:

establishing a parameter related to the flow of the cleaning gas according to a mathematical relation, measuring the parameter during the one or more plasma clean cycles to yield a measurement, and

calculating the volume of the cleaning gas in accordance with the measurement and the mathematical relation;

 establishing a volume per time of the flow of the cleaning gas, measuring the duration of the flow of the cleaning gas during the one or more plasma clean cycles to yield a time measurement, and calculating the volume of the cleaning gas in accordance with the time measurement and the volume per time of the flow of the cleaning gas;

 providing a notification that the volume of the cleaning gas used during the one or more plasma clean cycles has reached the predetermined volume; and

 scheduling the chamber maintenance procedure in response to the notification that the volume of the cleaning gas used during the one or more plasma clean cycles has reached the predetermined volume.